

ARTICLE 74-04-01
SEED POTATO CERTIFICATION STANDARDS

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74-04-01-01. Definitions. As used in this chapter:

1. "Basic seed" means seed potatoes produced by means of meristem, stem cutting, or other techniques for increase by certified growers.
2. "Certification" is strictly limited to the act of endorsing that the potatoes have met the standards or requirements specified in this chapter for seed potatoes. Certification does not mean or constitute any warranty that the potatoes are merchantable, disease free, fit for a particular purpose or anything other than that the potato crop was inspected and that at the time of inspection did meet the standards set forth in this chapter.
3. "Damaged by soil" means that the individual potato has more than fifty percent of its surface affected by light caked soil, or more than fifteen percent of its surface badly caked with soil.
4. "Dry land type", as allowed for long varieties only, means not seriously misshapen.
5. "Except for shape", as allowed for long varieties only, means the potatoes may be seriously misshapen.
6. "Experimental cultivar" means a numbered cultivar or cultivar that has not yet been released from a breeding program.
- ~~7.~~ 6. "Field year" means the time which is required for the potato plant to complete the growing cycle from planting in the field until maturity.
- ~~8.~~ 7. "Foundation seed" means a primary source of a genetically identified variety from which increases are made.
- ~~9.~~ 8. "Grade" refers to the tuber quality, condition, and size factors as specified in this chapter.

- ~~10.~~ ~~9.~~ "Inspection" means visual examination or observation of sample plants or tubers.
- ~~11.~~ ~~10.~~ "Latent diseases" means diseases not detectable by visual inspection.
- ~~12.~~ ~~11.~~ "Lightly caked with soil" means approximately one-eighth of an inch [3.18 millimeters] in depth.
- ~~13.~~ ~~12.~~ "Micropropagation" means the aseptic production of potato plantlets, tubers, or sprouts utilizing meristem culture.
- ~~14.~~ ~~13.~~ "Off type" means potato plants in a field that deviate in one or more characteristics from that which is usual in the variety being grown.
- ~~15.~~ ~~14.~~ "Plant Variety Protection Act" means a federal Act passed in 1970 which gives the owner of a novel variety the exclusive right to produce and market that variety.
- ~~16.~~ ~~15.~~ "Prenuclear seed" means plantlet propagation source resulting from the use of aseptic propagation techniques either in the laboratory or controlled environment.
- ~~17.~~ ~~16.~~ "Seed potatoes" means Irish potato tubers to be used for planting.
- ~~18.~~ ~~17.~~ "Seriously damaged by soil" means a potato having caked soil on more than one-half of the surface or an equivalent amount of soil in excessively thick chunks on a lesser area.
- ~~19.~~ ~~18.~~ "Tag" refers to the state seed department's official certification tag used to identify certified seed.
- ~~20.~~ ~~19.~~ "Tolerance" means a permissible allowance for such factors as disease, grade defects, and varietal mixture.
- ~~21.~~ ~~20.~~ "Virus tested" means tested for latent viruses by methods established by the state seed department.
- ~~22.~~ ~~21.~~ "Zero tolerance" means that no amount is permissible. It does not mean that the seed is absolutely free of a disease or disease-causing agent, grade defect, or varietal mixture, but that none was found during inspection.

History: Amended effective December 1, 1981; December 1, 1987; September 1, 1997; September 1, 2002.

General Authority: NDCC 4-10-03

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74-04-01-07. Seed classification and limited generation.

1. All seed potatoes must be limited to seven years of reproduction in the field. Seed lots may be reproduced beyond this limit with prior approval

of the state seed department providing the seed lot has been winter tested and eligible for recertification.

2. Prenuclear seed stocks must originate from tissue-culture derived plantlets, minitubers, microtubers, or pathogen-tested stem cuttings. Experimental breeding selections shall originate from pathogen-tested material. The first year of reproduction of these stocks will be regarded as nuclear seed stock (generation zero). Nuclear seed (first field year) is the progeny of prenuclear seed, generation 1 (second field year) is the progeny of nuclear seed, generation 2 (third field year) is the progeny of generation 1 seed, generation 3 (fourth field year) is the progeny of generation 2 seed, generation 4 (fifth field year) is the progeny of generation 3 seed, generation 5 (sixth field year) is the progeny of generation 4 seed, and certified generation (seventh field year) is the progeny of generation 5 seed. The certified designation will be granted to lots meeting the minimum standards outlined in section 74-04-01-08 and by approval of the commissioner.
3. Prenuclear seed stocks intended to be grown in the field as nuclear (GO) seed potatoes must be laboratory-tested, be demonstrated to be free of the following pathogens, and meet the following standards:
 - a. *Clavibacter michiganensis* subsp. *sepedonicus* (ring rot).
 - b. *Erwinia carotovora* (blackleg and soft rot).
 - c. Potato virus A.
 - d. Potato virus M.
 - e. Potato virus X.
 - f. Potato virus Y.
 - g. Potato leafroll virus.
 - h. Potato spindle tuber viroid.
 - i. All micropropagation production must be approved by a certification agency.
 - j. Good records must be maintained on all tests and submitted with the application for field inspection.
 - k. A minimum of one percent of the plantlets must have been tested for the above pathogens using the most reliable testing techniques.
4. Basic seed must originate from sources described above and developed in seed plots and have met specific field inspection and winter test standards established by the state seed department. Seed stocks will be grown a limited number of generations.

Experimental cultivars under evaluation by the seed department in cooperation with universities or industry will meet program requirements of and will be maintained under guidelines and standards established by the state seed department. Seed stocks will be grown a limited number of generations.

5. Foundation seed must be seed meeting standards for recertification.
 - a. Foundation seed will be produced on farms found to be free of bacterial ring rot for three years. All seed stocks must be replaced on a farm in which bacterial ring rot has been found.
 - b. Excessive blackleg symptoms will be cause for rejection as foundation stock.
6. The certified class must meet the minimum field tolerances described in section 74-04-01-08. The classification serves as a quality standard for commercial planting purposes only and must meet all the requirements and responsibilities of this chapter.
7. Generation numbers increase with years of field reproduction from the original seed source. Generation five will be the final generation of seed eligible for recertification. The certified seed class is not eligible for recertification. If seed availability is low for a specific potato variety, seed lots with more advanced generation numbers may be eligible for recertification providing the seed lot has passed a winter test and prior approval of the state seed department has been obtained.
8. Except for varietal mixtures, seed lots may be downgraded or advanced in generation if they do not meet the disease tolerances for that generation or they may be placed in the certified class and sold by their generation number as certified seed providing they meet the specifications for that class. Disease tolerances for each generation of seed are outlined in the section on field inspection standards.

History: Effective December 1, 1981; amended effective December 1, 1987; June 1, 1992; September 1, 1997; July 16, 2001; September 1, 2002.

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74-04-01-08. Field inspection standards.

1. Each seed potato field will be visibly inspected based on sample inspection. The method of inspection and sample size will be at the discretion of the state seed department but a minimum of one hundred plants per acre [.40 hectare] will be inspected. For varieties that do not express readily visible symptoms of a disease, laboratory testing may be done for the pathogen.
2. The field tolerance established will be based on visible symptoms in the samples inspected. Diseases which cannot be observed visibly may be present.

	First Inspection Tolerances (%)						Certified
	Generation						
	0	1	2	3	4	5	
Varietal mixture	0.1	0.2	0.3	0.5	0.5	0.5	0.5
Spindle tuber viroid	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Severe mosaics (PVY)	0.2	0.3	0.4	0.5	0.5	0.5	0.0-1.0
Leaf roll (PLRV)	0.2	0.3	0.4	0.5	0.5	0.5	0.0-1.0
Total serious virus	0.2	0.3	0.4	0.5	0.5	0.5	1.0
*Bacterial ring rot	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potato mop top virus	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	Second and all Subsequent Inspections Tolerances (%)						
	Generation						
	0	1	2	3	4	5	Certified
Varietal mixture	0.1	0.1	0.2	0.3	0.3	0.3	0.3
Spindle tuber viroid	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Severe mosaics (PVY)	0.0	0.1	0.2	0.3	0.3	0.3	0.0-1.0
Leaf roll (PLRV)	0.0	0.1	0.2	0.3	0.3	0.3	0.0-1.0
Total serious virus	0.0	0.1	0.2	0.3	0.3	0.3	1.0
*Bacterial ring rot	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potato mop top virus	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Late blight found during field inspection must be confirmed by symptoms or laboratory diagnosis before being reported on the inspection report.

* The zero tolerance means that no amount is permissible when inspected. It does not mean that the seed is absolutely free of disease or disease-causing agents, but that none was found during inspection.

Varieties that do not express visible disease symptoms. Potato varieties that do not express visible disease symptoms of a specific pathogen may be subjected to a laboratory test to determine the levels of the pathogen in a seed lot. This testing

may occur during the growing season or during the winter test, or both, and may affect eligibility of the seed lot.

Blackleg. Since the blackleg disease may be latent, the inspector will record only the percentage observed during the first and second inspection, and no tolerance will be established. However, any excessive amount can be cause for rejection. Blackleg observations shall be based upon sample plants exhibiting the characteristic black, inky, soft, slimy, decomposed tissue of the stem.

Wilt. Only the percentage noted will be recorded on the first and second inspection, and may include other factors such as maturity, drought, or alkali problems but any excessive amount may be cause for rejection.

There will be zero tolerance for potato wart, corky ring spot, gangrene, golden nematode, root knot nematode, tuber moths, or other such injurious pests that have never been found and confirmed in North Dakota seed potato fields.

Tolerances for potato virus x tested seed. All of the above tolerances will apply, including a requirement that bacterial ring rot must not have been found on the farm during the season. Seed lots with no more than two percent potato virus x infection may be identified as virus x tested on certification tags.

3. Field conditions.

- a. Insect control must be maintained early and until the vines are killed or matured. Fields suffering excessive insect injury may be disqualified for certification. A grower will notify the inspector of the date of spraying and spray material applied.
- b. Vine killing. If a field has not received final inspection, the grower must obtain approval from the inspector before killing the vines. Furthermore, if the inspector deems it appropriate, strips of unkilled vines must be left in the seed fields to facilitate final inspections. When strips are left for inspection, the first twelve rows (if a six-row planter was used, eight rows if a four-row planter was used) must not be vine-killed. It will be the responsibility of the seed producer to identify where seed planting began. Approximately ten percent of the seed field acreage must be left in strips.
- c. Any condition such as excess weeds, hail injury, foreign plants, chemical damage, soil conditions, or insect damage that interferes with proper inspection may disqualify the seed for certification.
- d. Roguing is permitted and recommended in many cases but must be done before the inspector arrives in the field.
- e. Presence of disease or conditions not mentioned heretofore which may impair seed quality shall constitute cause for rejection or additional testing before final certification. Stocks which show an excessive percentage of total serious virus in official southern

sample tests shall be considered ineligible for certification tags.

4. Appeal inspection of rejected fields will be considered, provided application is made within three days after rejection, the field is in good condition for inspection, and no additional roguing is done previous to reinspection.
5. Bacterial ring rot control.
 - a. All seed produced by a farming operation in which bacterial ring rot has been found will be ineligible for recertification the following year.
 - b. If the farming operation is found to be infected, all equipment and storages must be cleaned and disinfected.
 - c. A farming operation found to be infected on three consecutive years is required to repurchase all new seed, clean, and disinfect the operation under the supervision of the state seed department before being eligible to enter any seed for certification.
 - d. A farming operation found to be infected on three consecutive years shall be required to purchase all new seed, clean, and disinfect the operation under the supervision of the state seed department before entering any seed for certification.

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